TO2270 DT699260

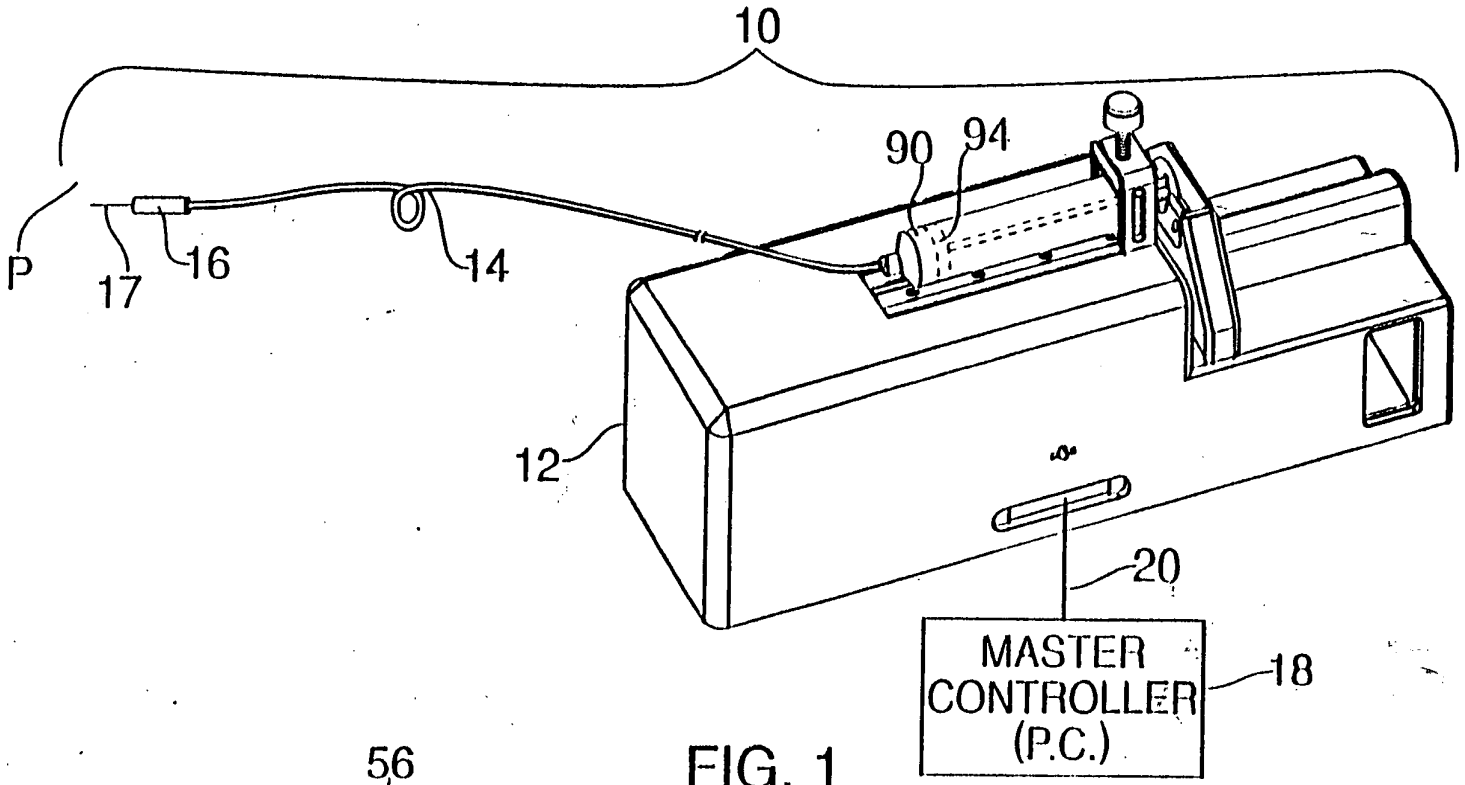


FIG. 1

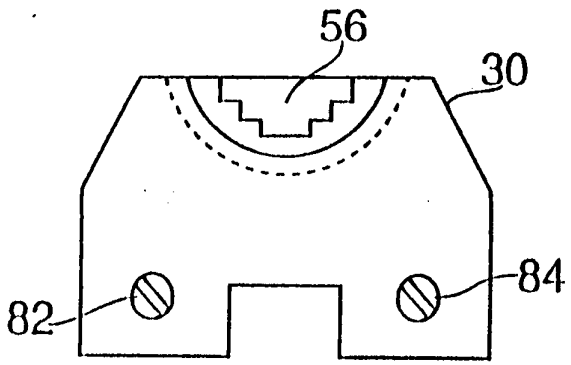


FIG. 7B

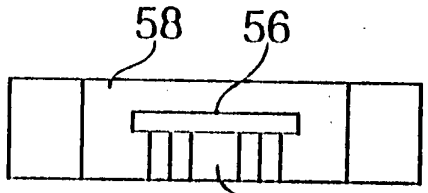


FIG. 7A

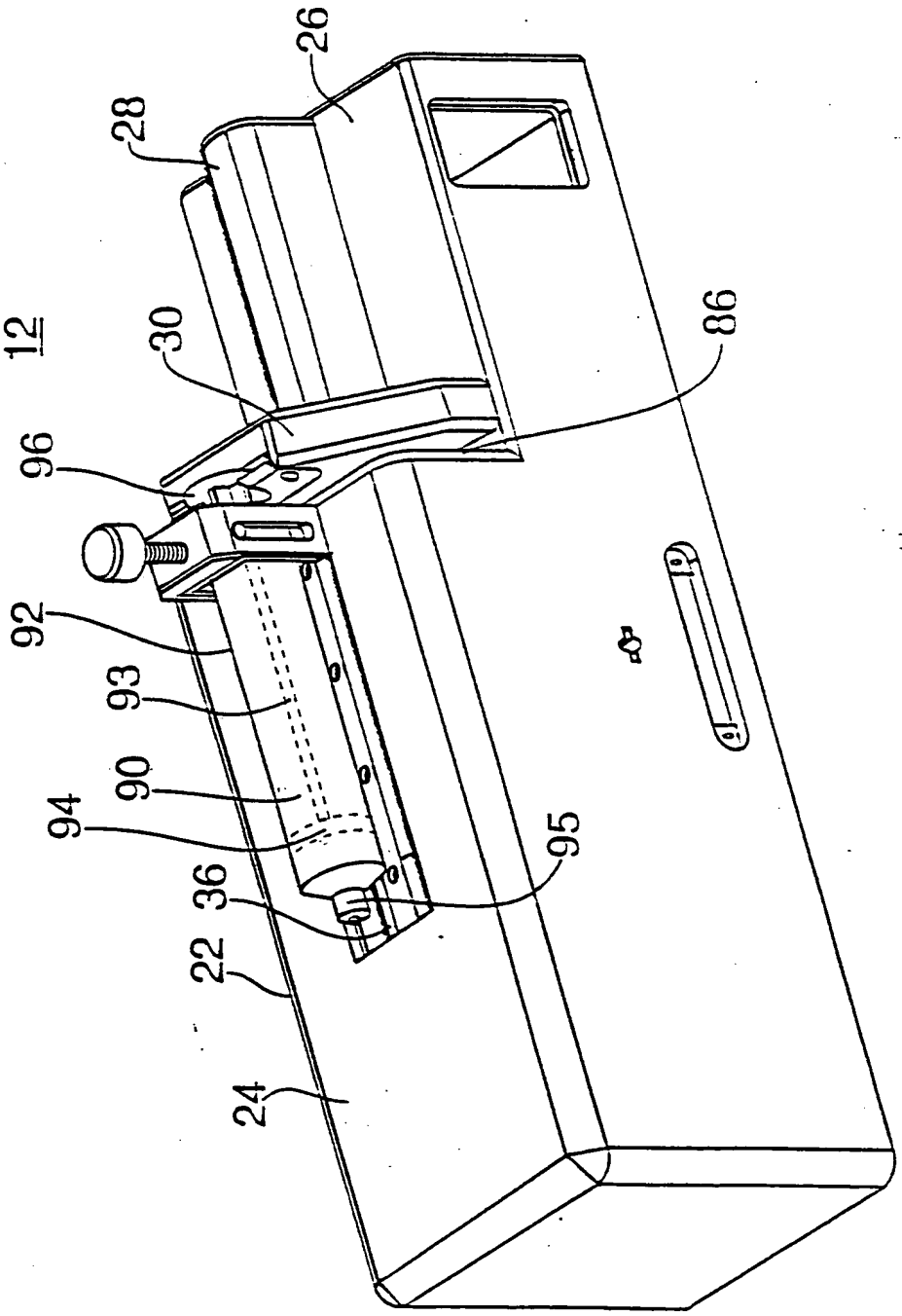


FIG. 2

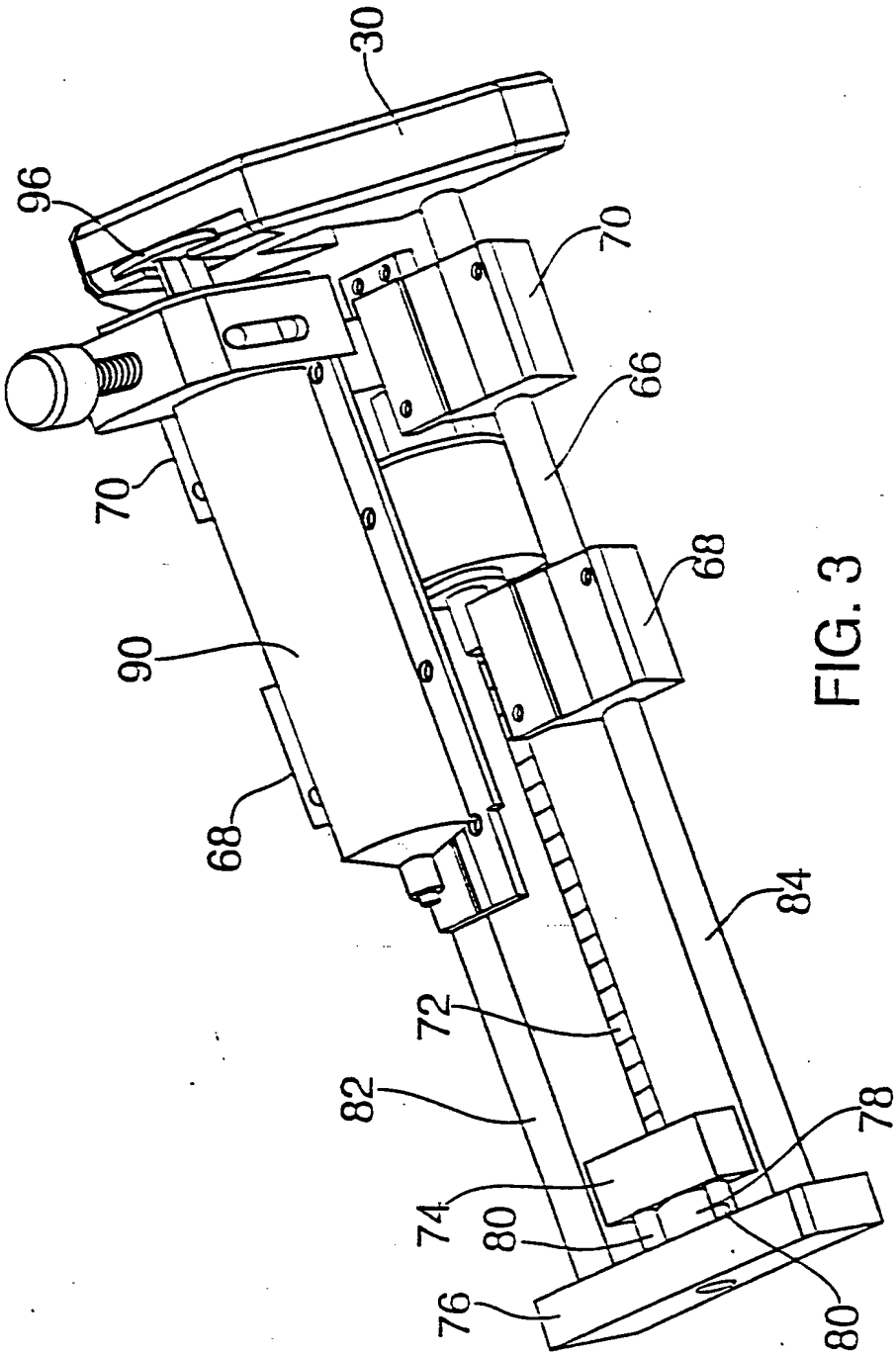


FIG. 3

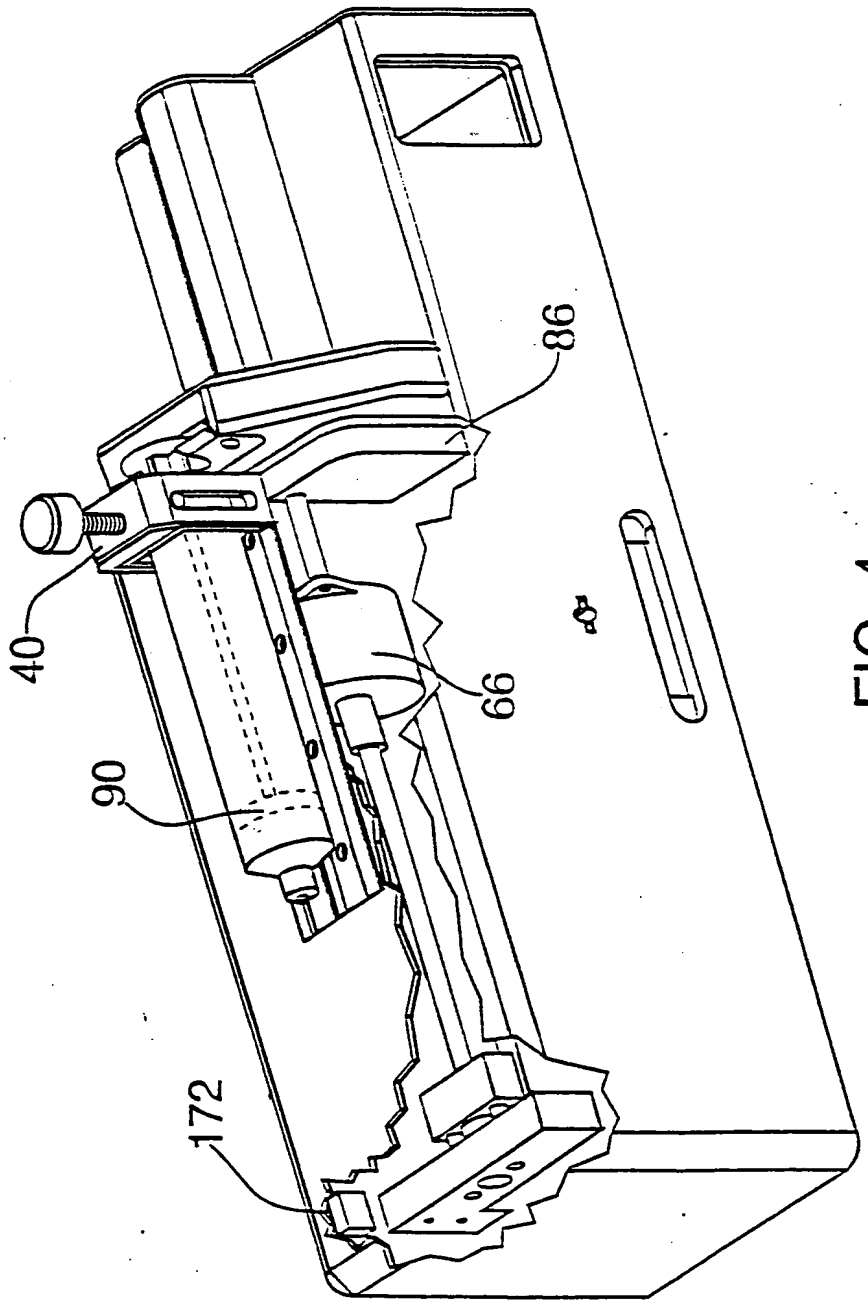


FIG. 4

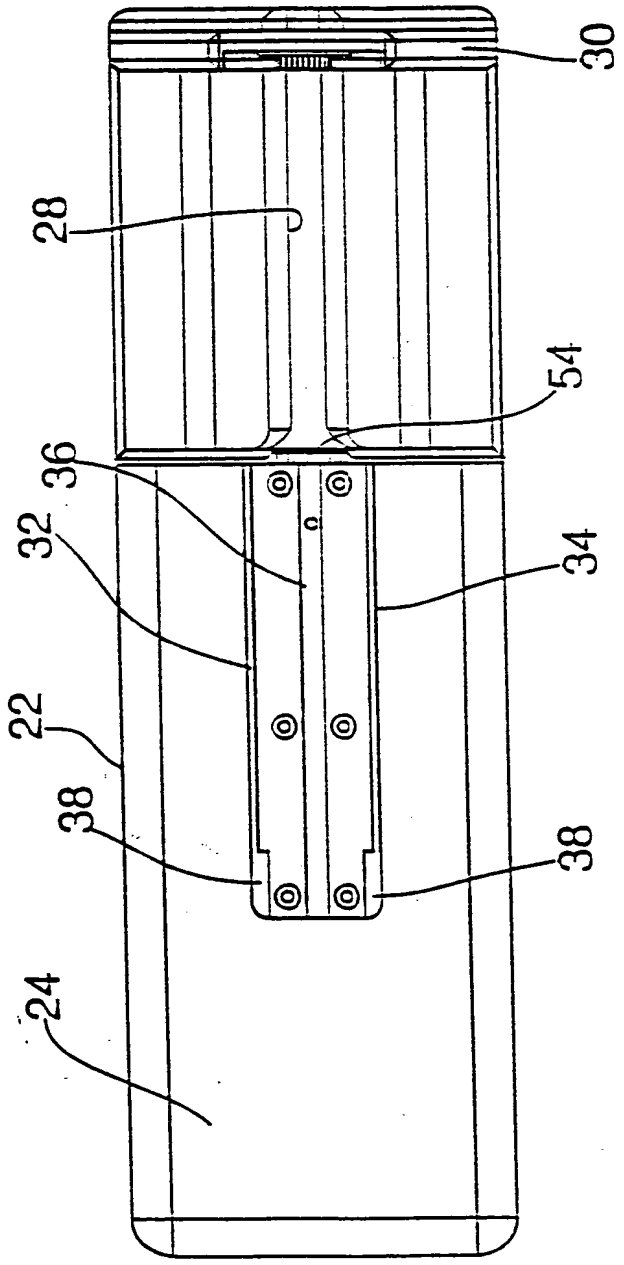


FIG. 5A

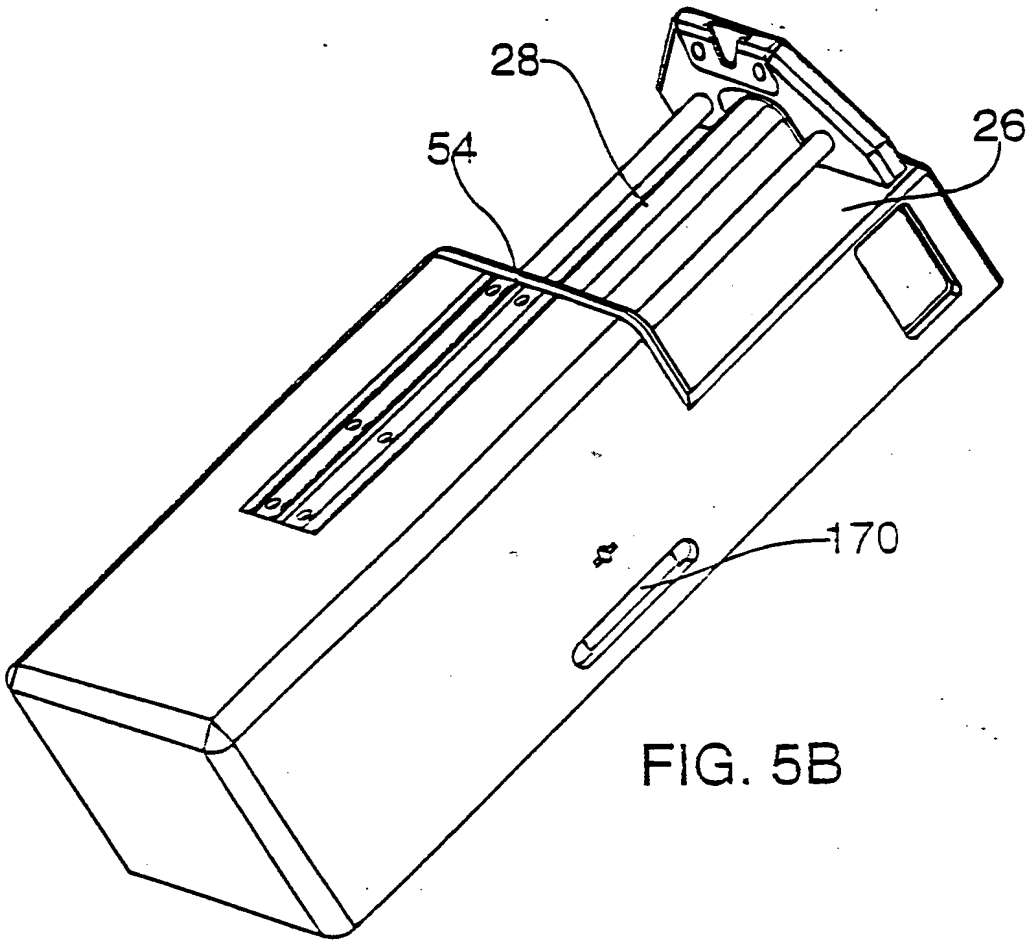

28
54
26
170

FIG. 5B

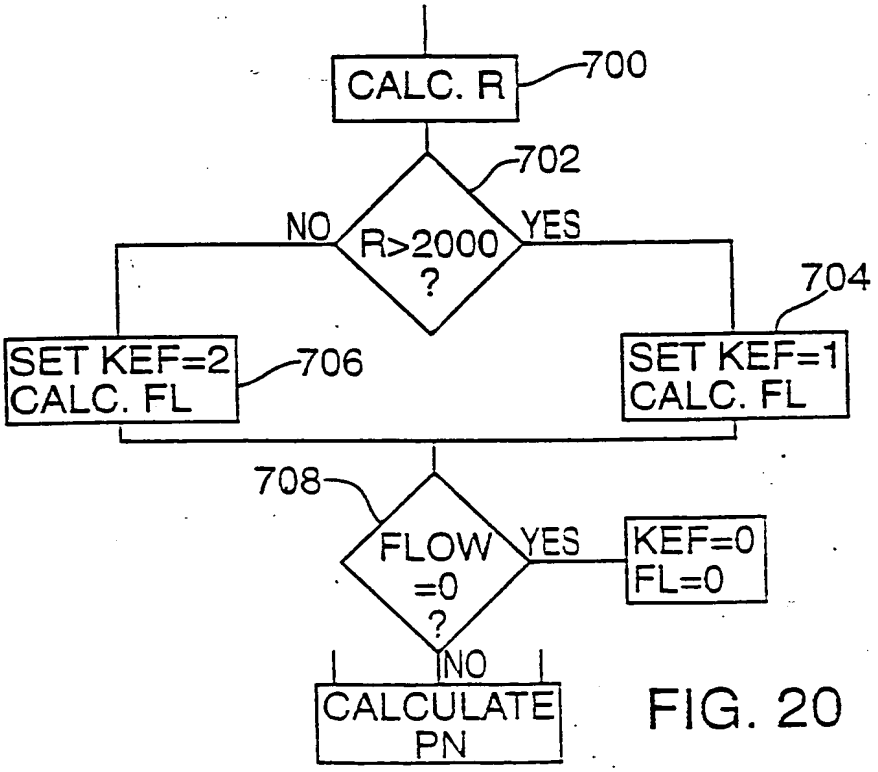

CALC. R
700
702
NO
R>2000 ?
YES
704
SET KEF=2
CALC. FL
706
SET KEF=1
CALC. FL
708
FLOW =0 ?
YES
KEF=0
FL=0
NO
CALCULATE PN

FIG. 20

TO2270 0T699260

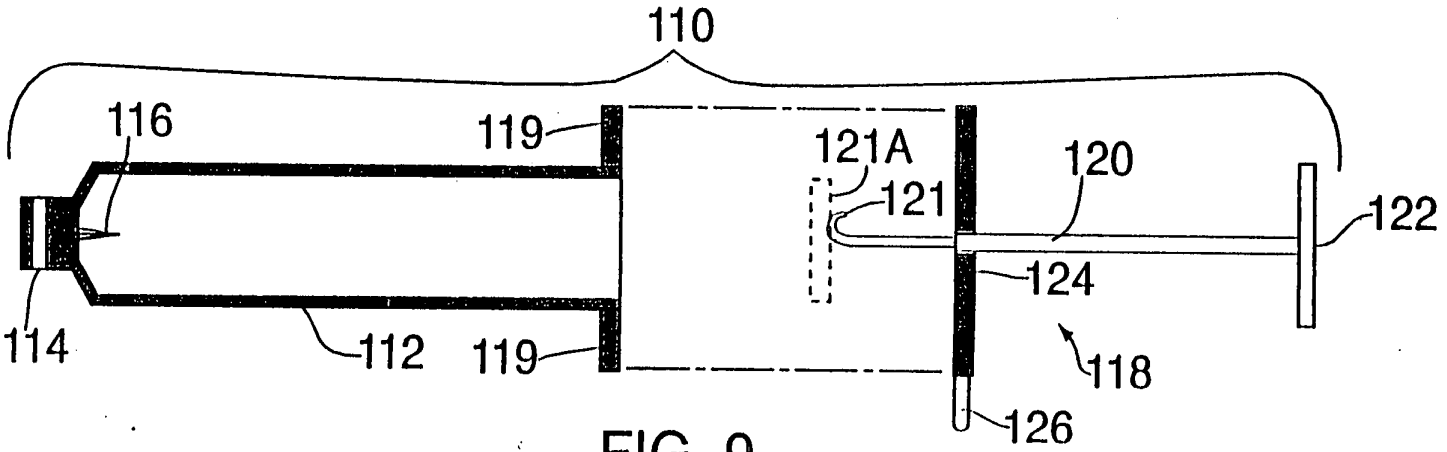


FIG. 9

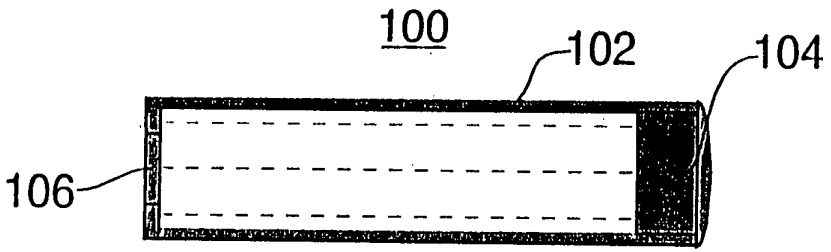


FIG. 8
(PRIOR ART)

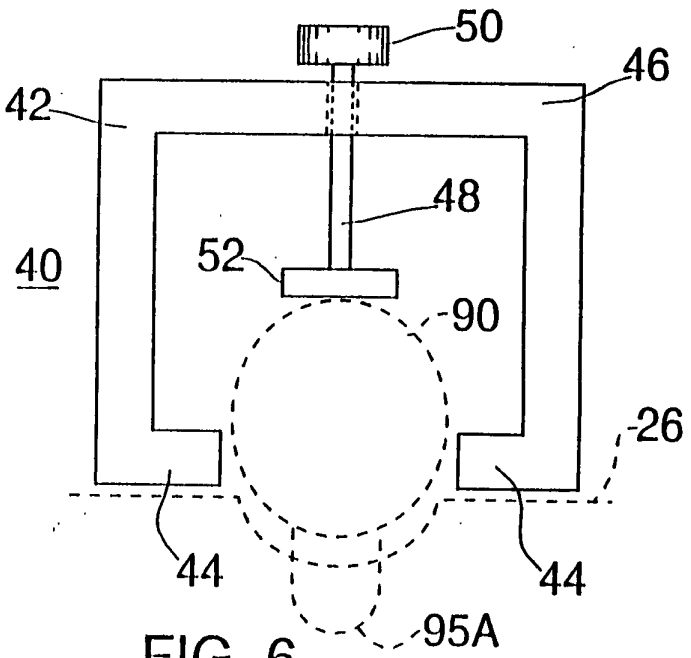


FIG. 6

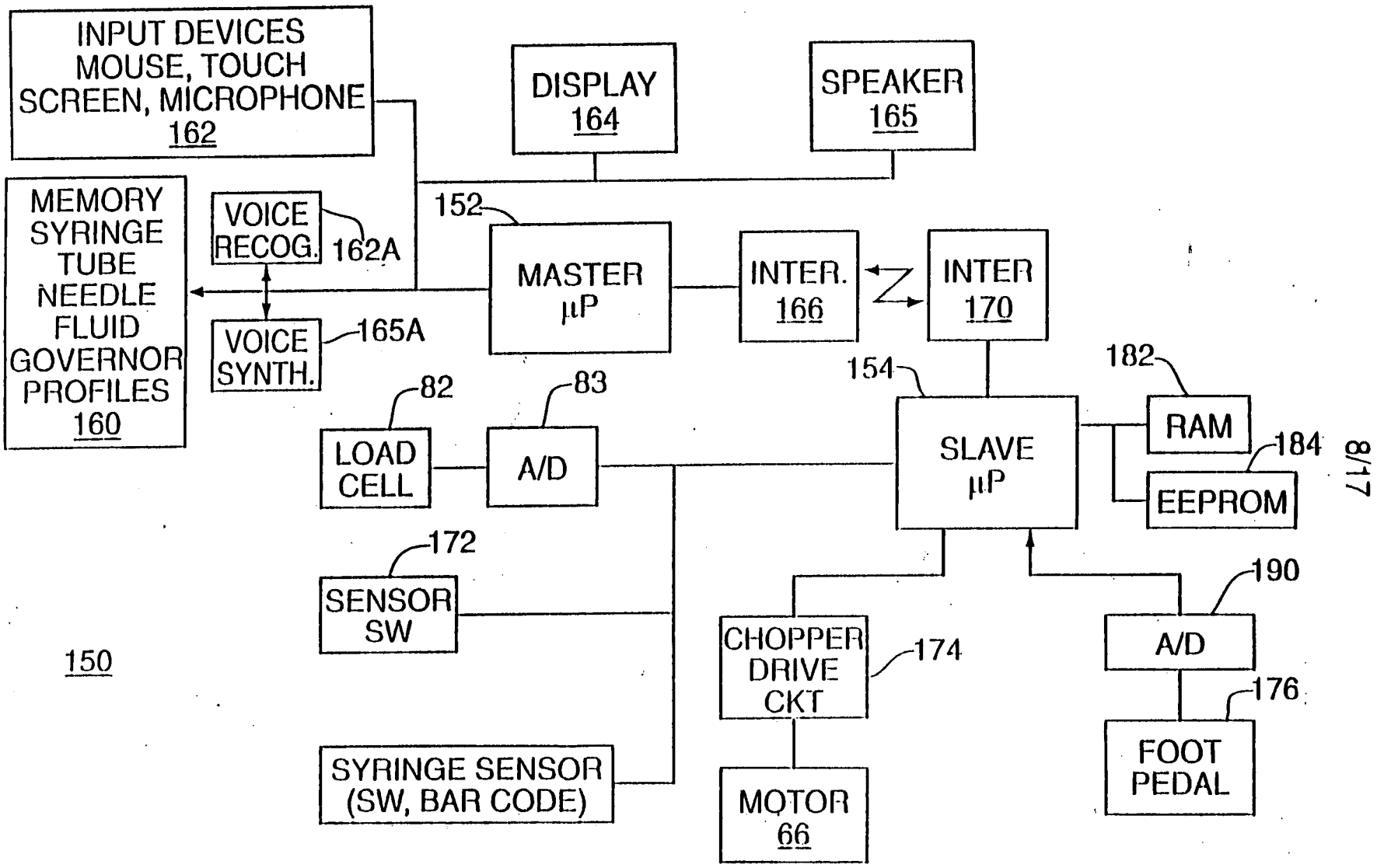

INPUT DEVICES
MOUSE, TOUCH
SCREEN, MICROPHONE
162
DISPLAY
164
SPEAKER
165
MEMORY
SYRINGE
TUBE
NEEDLE
FLUID
GOVERNOR
PROFILES
160
VOICE
RECOG.
162A
VOICE
SYNTH.
165A
152
MASTER
μP
INTER.
166
INTER
170
154
182
RAM
184
EEPROM
SLAVE
μP
82
LOAD
CELL
83
A/D
172
SENSOR
SW
SYRINGE SENSOR
(SW, BAR CODE)
CHOPPER
DRIVE
CKT
174
MOTOR
66
190
A/D
176
FOOT
PEDAL
150
8/17

FIG. 10

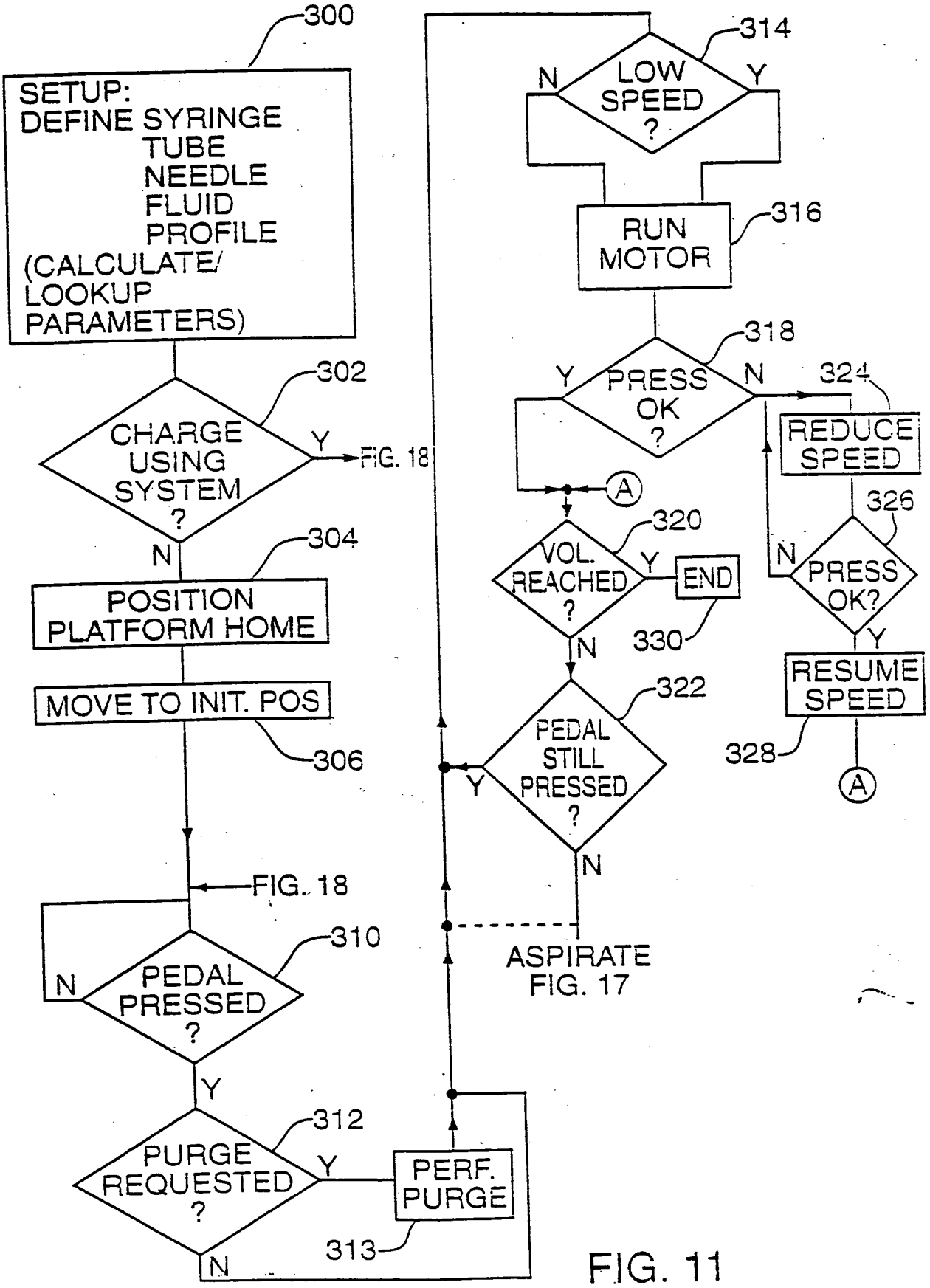
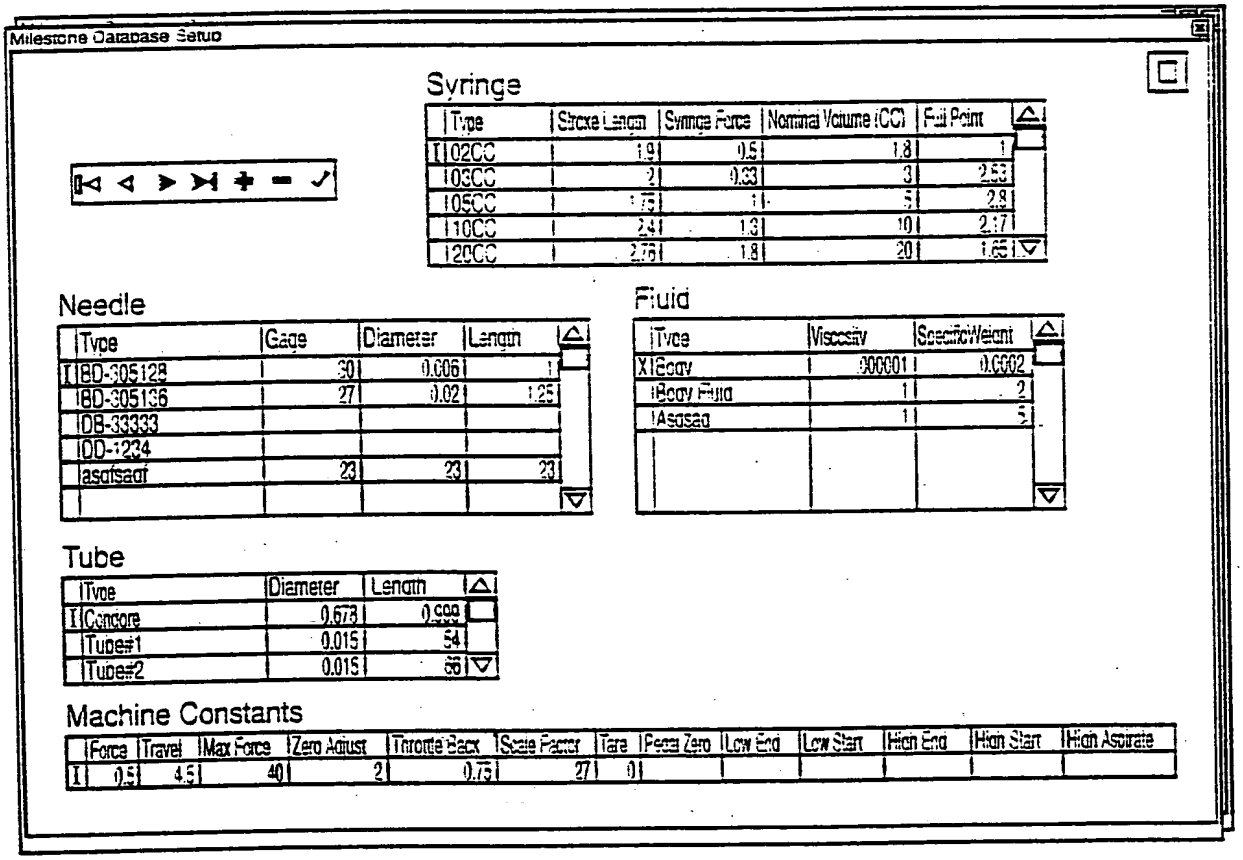

300
SETUP:
DEFINE SYRINGE
TUBE
NEEDLE
FLUID
PROFILE
(CALCULATE/
LOOKUP
PARAMETERS)
302
CHARGE USING SYSTEM ?
Y
FIG. 18
N
304
POSITION PLATFORM HOME
MOVE TO INIT. POS
306
FIG. 18
310
N
PEDAL PRESSED ?
Y
312
PURGE REQUESTED ?
Y
PERF. PURGE
313
N
314
N
LOW SPEED ?
Y
RUN MOTOR
316
318
Y
PRESS OK ?
N
324
REDUCE SPEED
A
320
VOL. REACHED ?
Y
END
330
N
326
N
PRESS OK?
Y
RESUME SPEED
328
A
322
Y
PEDAL STILL PRESSED ?
N
ASPIRATE
FIG. 17

FIG. 11



Machine Profile Setup Screen
Set Values for Components of Delivery System
Setup Variable for Machine

FIG. 12A

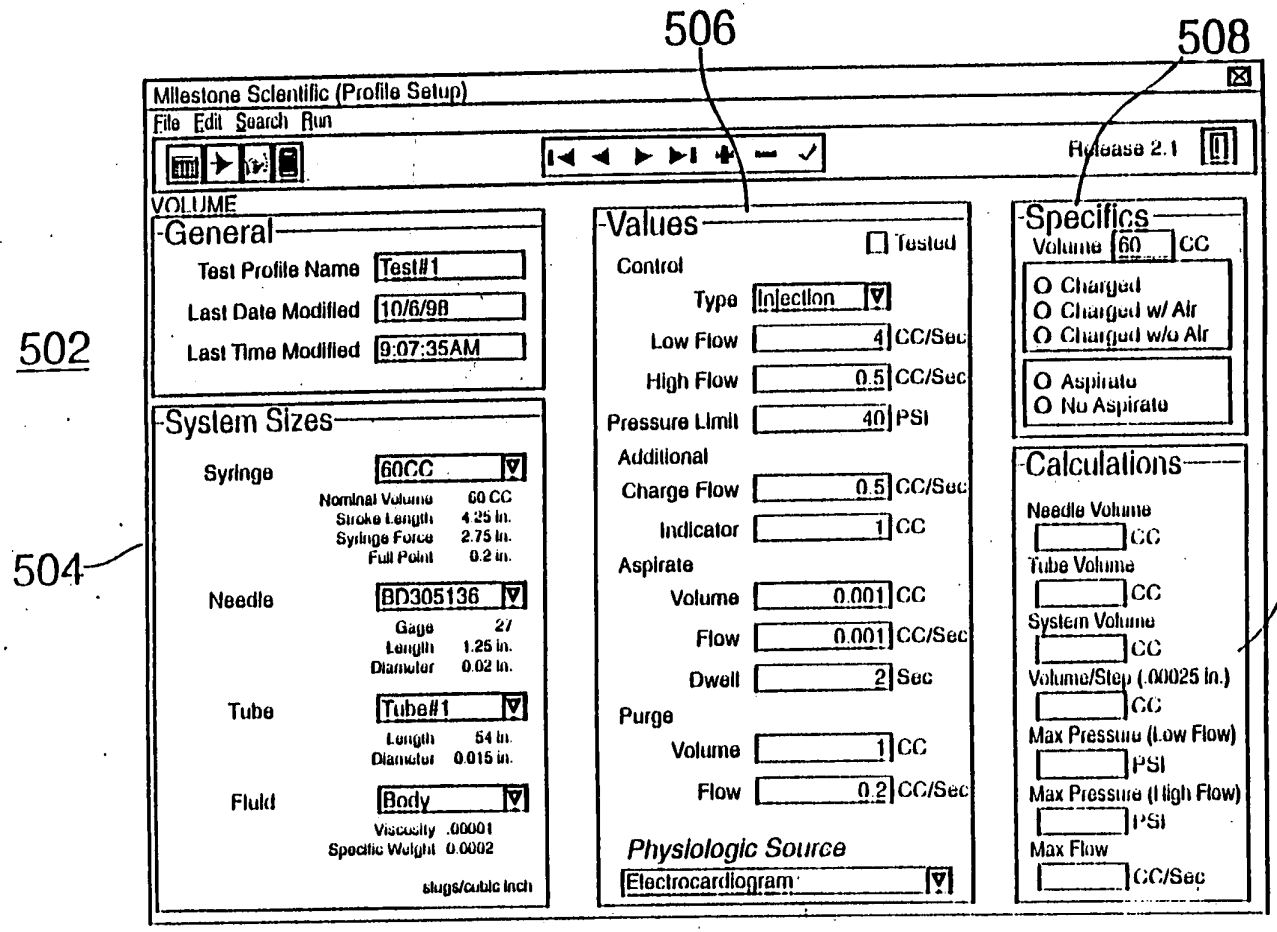

506
508
Milestone Scientific (Profile Setup)
File Edit Search Run
Release 2.1
VOLUME
General
Test Profile Name
Test#1
Last Date Modified
10/6/98
Last Time Modified
9:07:35AM
System Sizes
Syringe
60CC
Nominal Volume 60 CC
Stroke Length 4.25 in.
Syringe Force 2.75 lb.
Full Point 0.2 in.
Needle
BD305136
Gage 27
Length 1.25 in.
Diameter 0.02 in.
Tube
Tube#1
Length 54 in.
Diameter 0.015 in.
Fluid
Body
Viscosity .00001
Specific Weight 0.0002
slugs/cubic inch
Values
Tested
Control
Type
Injection
Low Flow
4
CC/Sec
High Flow
0.5
CC/Sec
Pressure Limit
40
PSI
Additional
Charge Flow
0.5
CC/Sec
Indicator
1
CC
Aspirate
Volume
0.001
CC
Flow
0.001
CC/Sec
Dwell
2
Sec
Purge
Volume
1
CC
Flow
0.2
CC/Sec
Physiologic Source
Electrocardiogram
Specifics
Volume
60
CC
O Charged
O Charged w/ Air
O Charged w/o Air
O Aspirate
O No Aspirate
Calculations
Needle Volume
CC
Tube Volume
CC
System Volume
CC
Volume/Step (.00025 in.)
CC
Max Pressure (Low Flow)
PSI
Max Pressure (High Flow)
PSI
Max Flow
CC/Sec
502
504
510

FIG. 12B

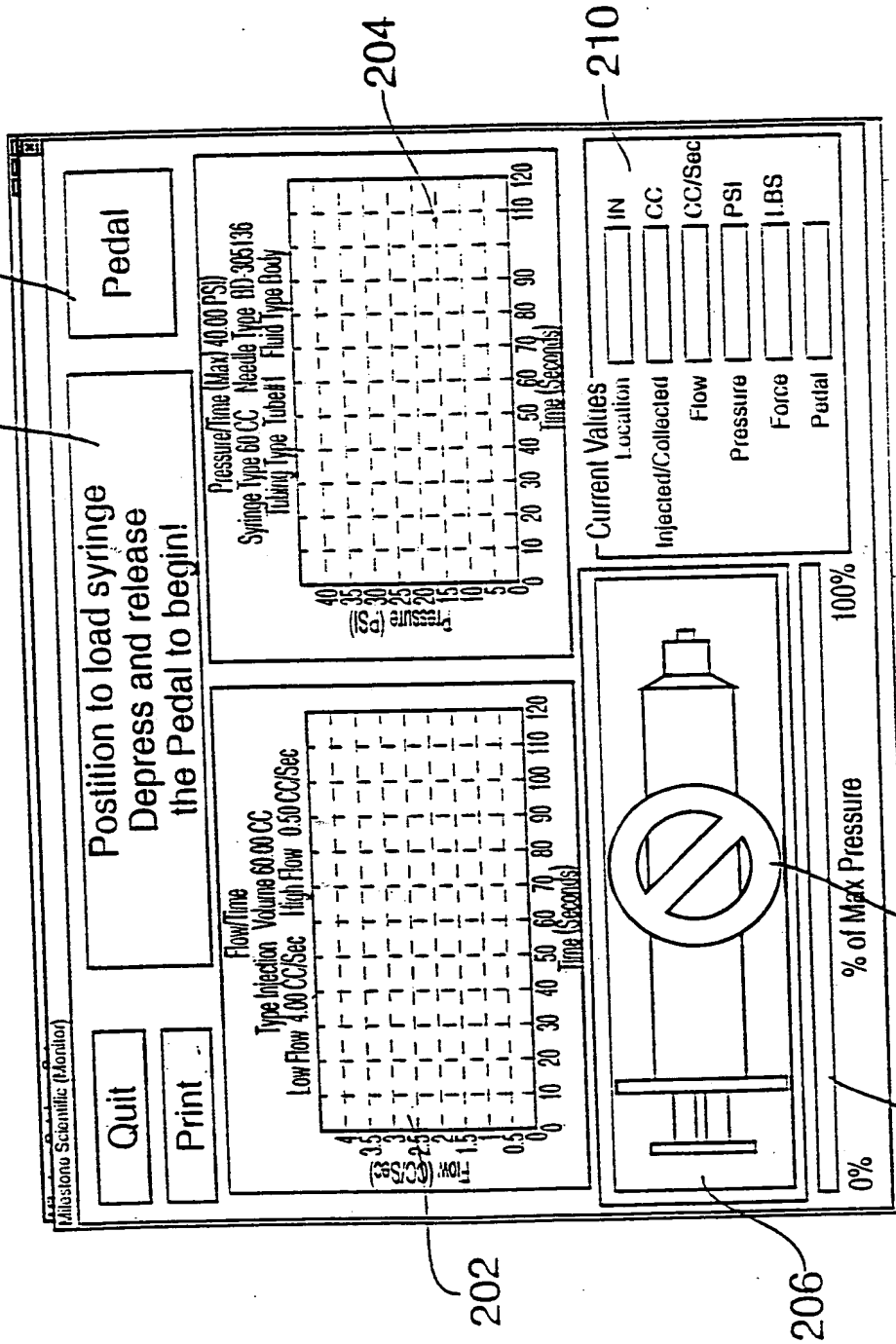

Milestone Scientific (Monitor)
Quit
Print
Position to load syringe
Depress and release
the Pedal to begin!
Pedal
Flow/Time
Type Injection Volume 60.00 CC
Low Flow 4.00 CC/Sec High Flow 0.50 CC/Sec
Time (Seconds)
Pressure/Time (Max) 40.00 PSI)
Syringe Type 60 CC Needle Type 8D-305136
Tubing Type Tube#1 Fluid Type Body
Time (Seconds)
Current Values
Location
Injected/Collected
Flow
Pressure
Force
Pedal
IN
CC
CC/Sec
PSI
LBS
0%
% of Max Pressure
100%

FIG. 13

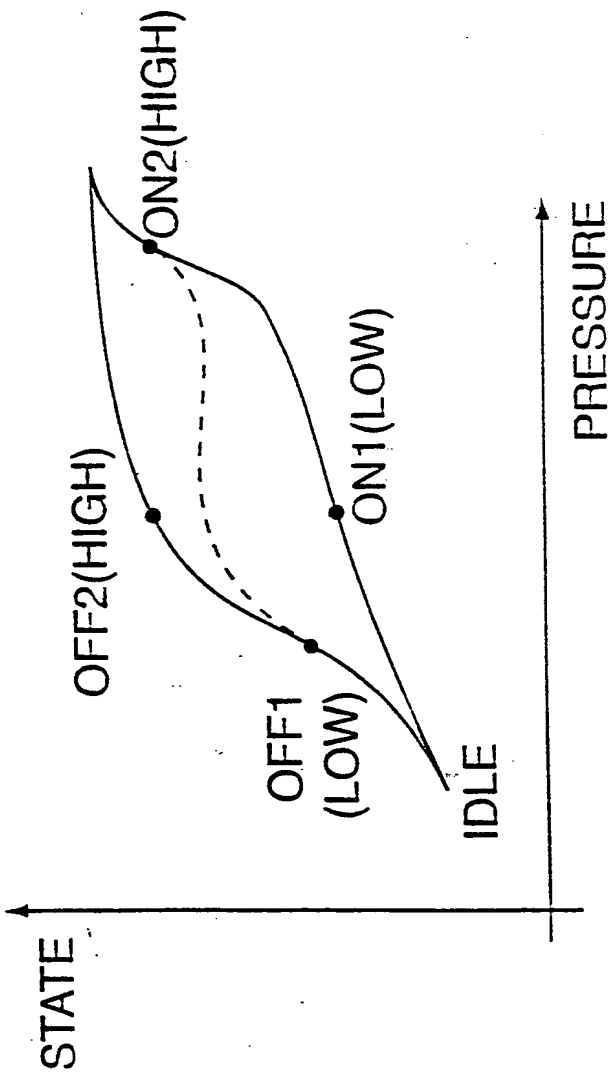


FIG. 14

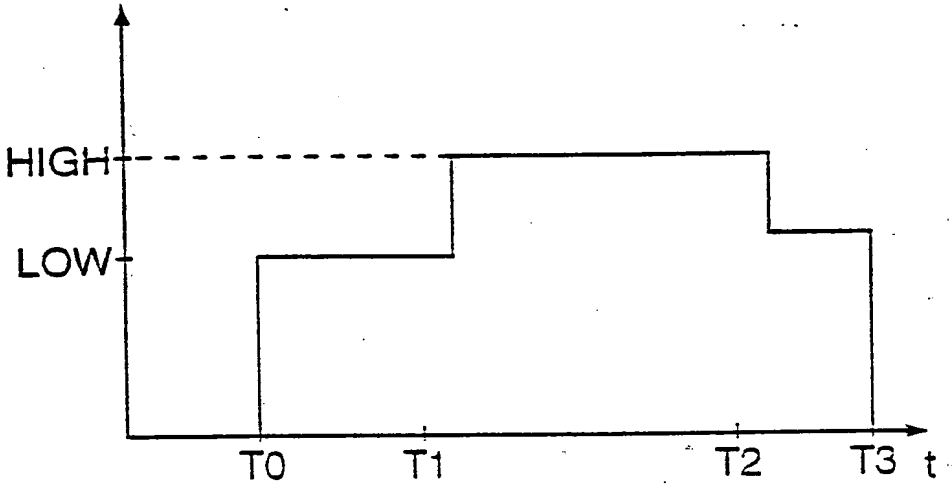


FIG. 15A

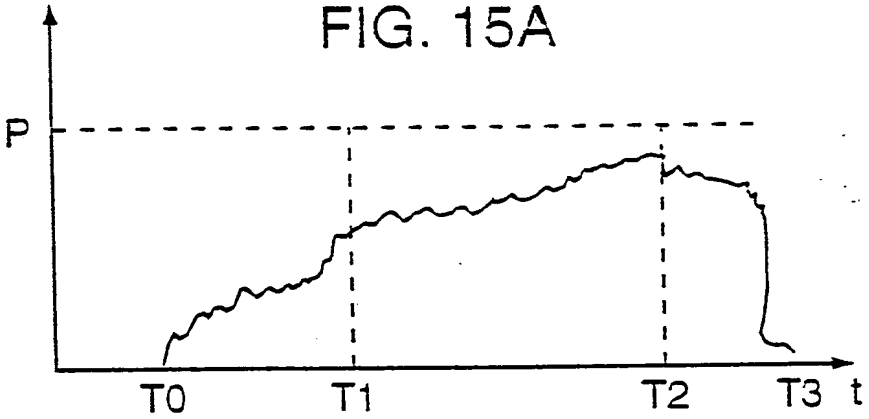


FIG. 15B

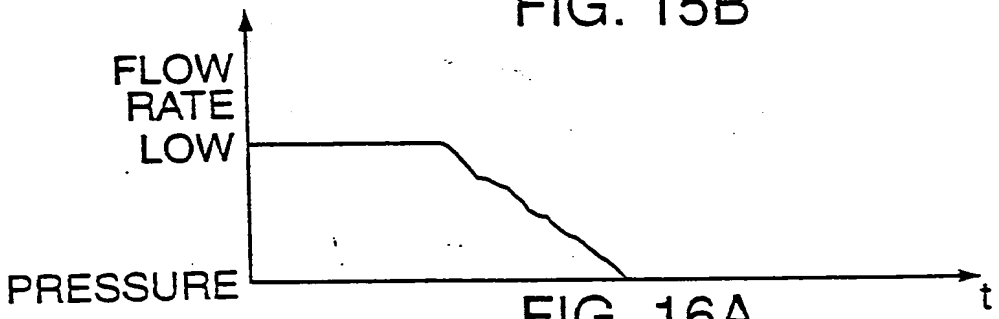


FIG. 16A

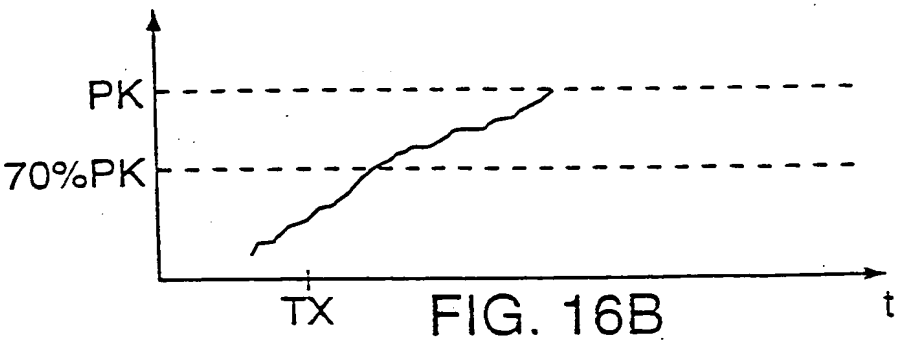


FIG. 16B

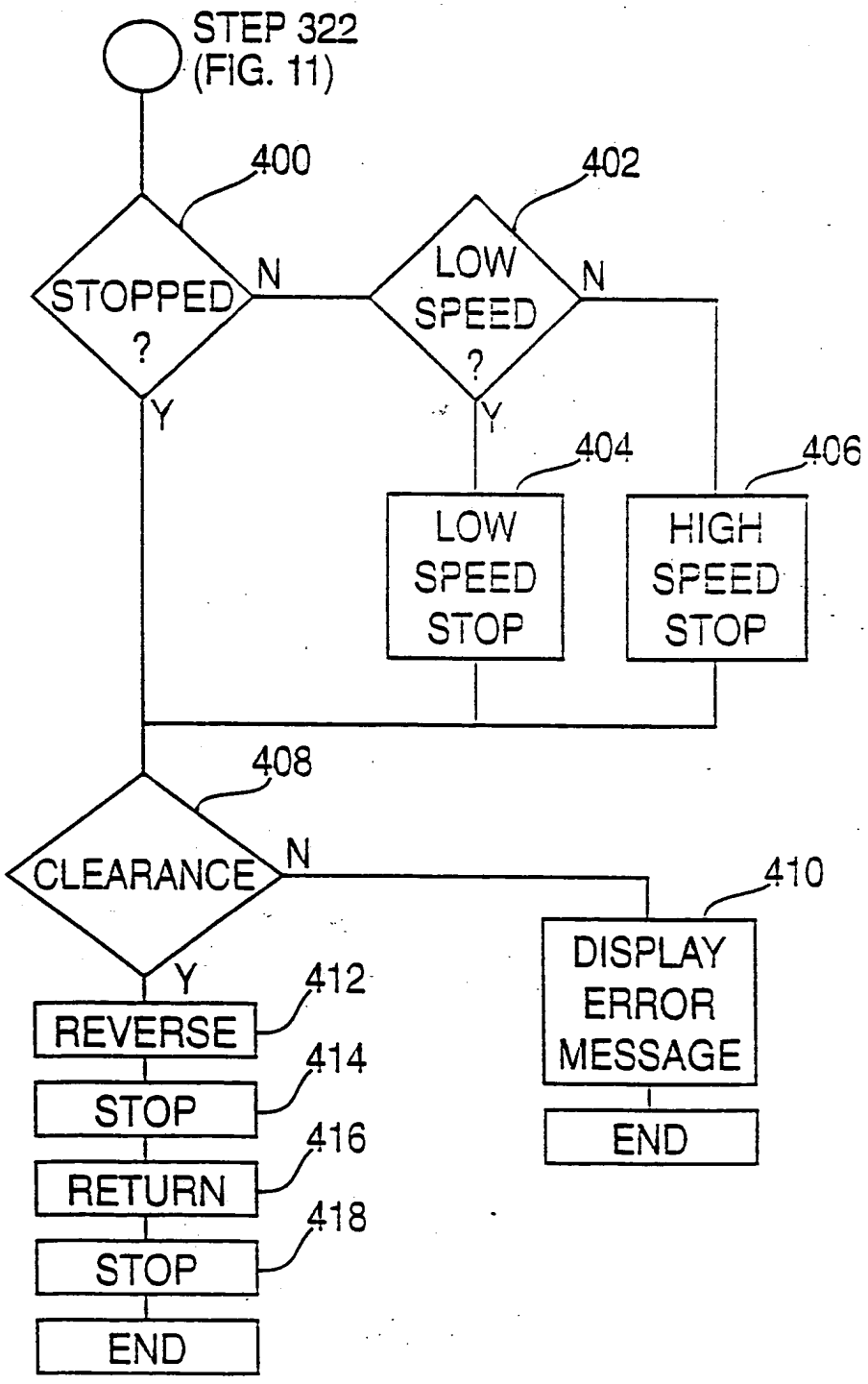

STEP 322
(FIG. 11)
400
STOPPED ?
N
Y
402
LOW SPEED ?
N
Y
404
LOW SPEED STOP
406
HIGH SPEED STOP
408
CLEARANCE
N
Y
410
DISPLAY ERROR MESSAGE
END
412
REVERSE
414
STOP
416
RETURN
418
STOP
END

FIG. 17

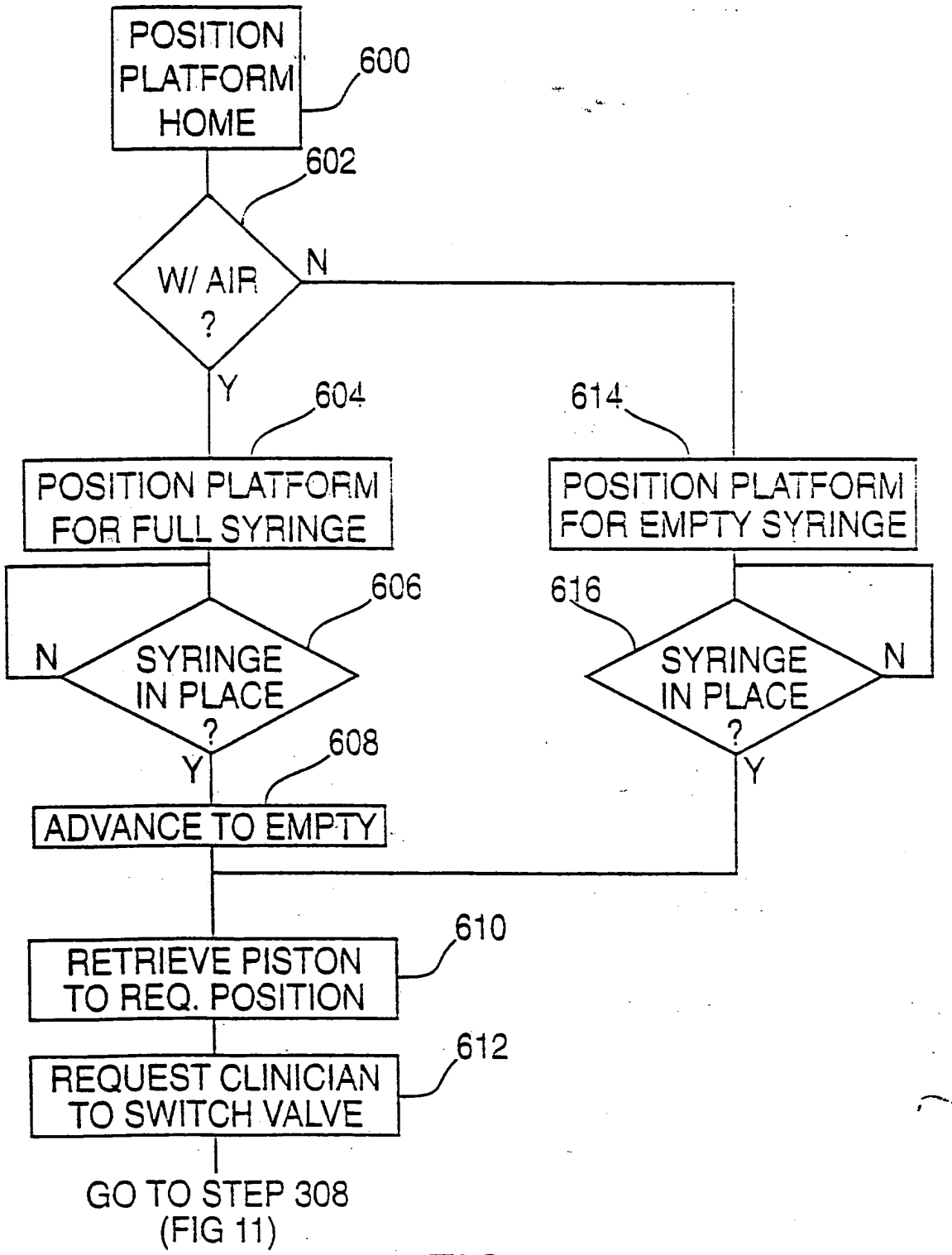

POSITION PLATFORM HOME
600
602
W/ AIR ?
N
Y
604
POSITION PLATFORM FOR FULL SYRINGE
614
POSITION PLATFORM FOR EMPTY SYRINGE
606
N
SYRINGE IN PLACE ?
Y
608
ADVANCE TO EMPTY
616
SYRINGE IN PLACE ?
N
Y
610
RETRIEVE PISTON TO REQ. POSITION
612
REQUEST CLINICIAN TO SWITCH VALVE
GO TO STEP 308 (FIG 11)

FIG. 18

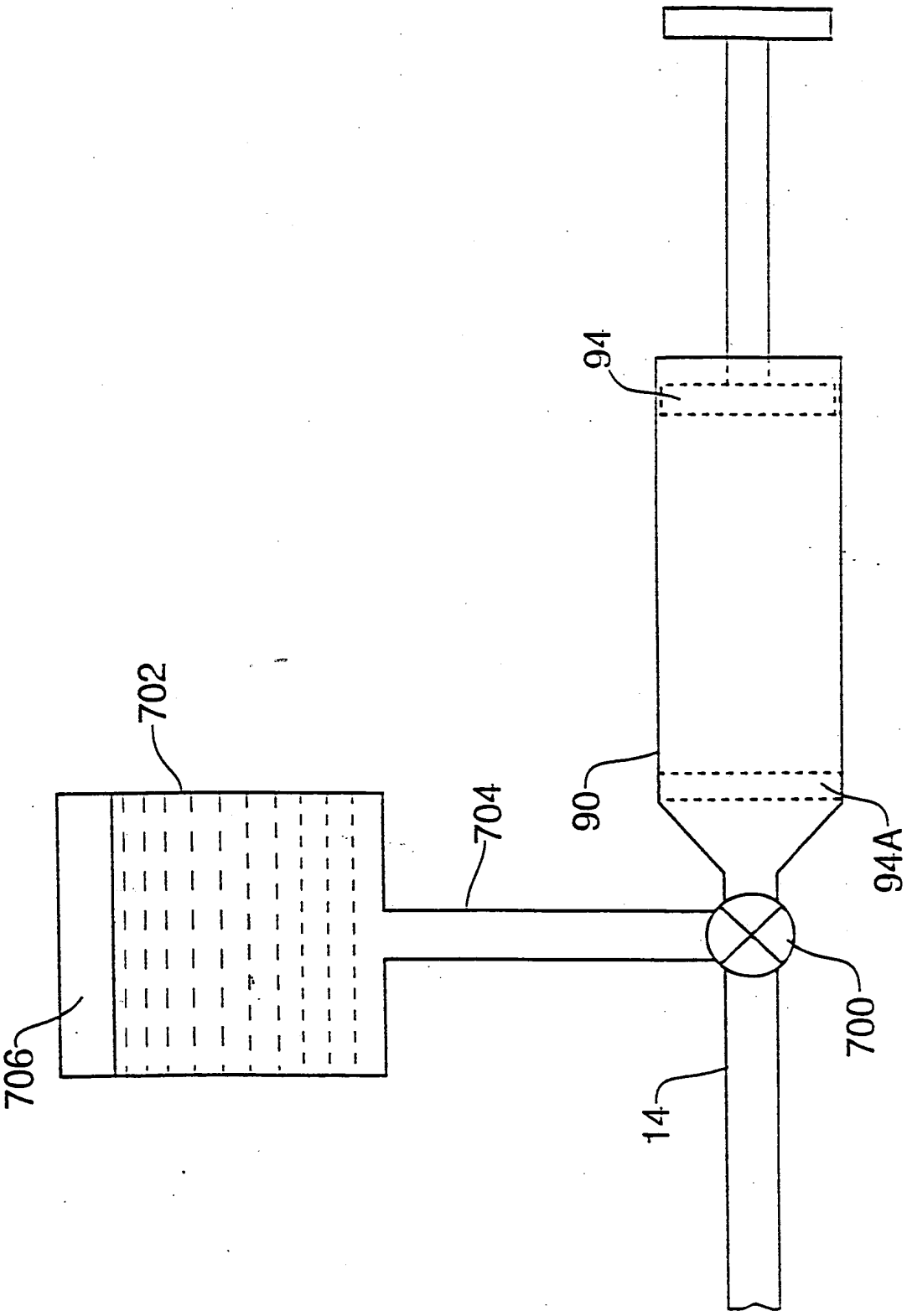


FIG. 19